

CLAIMS

*Sub 1*

1. System, especially for a motor vehicle, able, on the one hand, to start up an internal-combustion engine and, on the other hand, to charge an electrical circuit, including a main electrical machine able to operate, on the one hand, as a generator and, on the other hand, as an electric motor, the said electrical machine driving the internal-combustion engine by means of a belt when it is operating in motor mode, the system further including management means which drive the main electrical machine, characterised in that it includes a supplementary starter, as well as means for detecting at least one condition for triggering the activation of the said supplementary starter, and the management means drive the main electrical machine and the starter, according to a particular sequence, when the said condition is detected by the said detection means.

2. System according to Claim 1, characterised in that the said detection means include at least one temperature sensor, as well as means for comparing a temperature measured by the said sensor with a particular low threshold.

*Sub 2*

3. System according to one of Claims 1 and 2, characterised in that the detection means include means for detecting a failure to start at the end of a given time during which the main electrical machine is operating in motor mode.

4. System according to one of the preceding claims, characterised in that the management means include means for actuating the supplementary starter, when a condition for activating the supplementary starter is detected, in such a way that its pinion meshes on a complementary ring in order to drive the internal-combustion engine, in order to drive the main electrical machine in motor mode, when the pinion of the

starter has been meshed and in order to cut off the starter and drive the main electrical machine in generator mode when it is detected that the internal-combustion engine has started.

5 5. System according to Claim 4, characterised in that the management means include means for cutting off the operation of the main electrical machine in motor mode, when a condition for activation of the supplementary starter is detected.

10 6. Method for control of a system, especially for a motor vehicle, able, on the one hand, to start up an internal-combustion engine and, on the other hand, to charge an electrical circuit, including a main electrical machine able to operate, on the one hand, as a generator and, on the other hand, as an electric motor, the said electrical machine driving the internal-combustion engine by means of a belt when it is operating in motor mode, characterised in that, with the said system including a supplementary starter, at least one condition for triggering the activation of the said supplementary starter is detected, and the main electrical machine and the starter are driven according to a particular sequence when the said condition is detected.

25 7. Method according to Claim 6, characterised in that, in order to detect a triggering condition, at least one temperature is measured and a temperature thus measured is compared with a particular low threshold.

30 8. Method according to one of Claims 6 and 7, characterised in that, in order to detect a triggering condition, a failure to start is detected at the end of a given time during which the main electrical machine is operating in motor mode.

35 9. Method according to one of Claims 6 to 8, characterised in that, when a condition for activating the

supplementary starter is detected, the supplementary starter is actuated in such a way that its pinion meshes on a complementary ring in order to drive the internal-combustion engine, the main electrical machine is put into motor mode, when the pinion of the starter has been meshed, and the starter is cut off and the main electrical machine is placed into generator mode when it is detected that the internal-combustion engine has started.

- 10 10. Method according to Claim 9, characterised in that the operation of the main electrical machine in motor mode is cut off when a condition for activation of the supplementary starter is detected.

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